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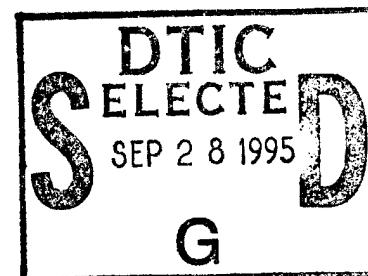


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MDFF HELP Library Design Document

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The purpose of this report is to describe the design of the on-line HELP library for the Naval Research Laboratory's Map Data Formatting Facility (MDFF). The MDFF HELP library is intended to provide accurate and current information about the MDFF and its software components. The MDFF CAC production software utilizes Digital Equipment Corporation computer hardware and software and this report assumes that the reader is familiar with the VAX/VMS operating system.			
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MDFF HELP Library Design Document

INTRODUCTION

The MDFF HELP library is intended to provide accurate and current information about the Map Data Formatting Facility (MDFF) and its software components. The library was designed to be easily accessed, user-friendly, and easily maintained. This library contains on-line information about all Compressed Aeronautical Chart (CAC) processing phases, the suite of CAC production software, and other information relevant to CAC production and MDFF operations.

The CAC production software utilizes Digital Equipment Corporation (DEC) computer hardware and software. This Memorandum Report assumes that the reader is familiar with the VAX/VMS operating system. The VAX/VMS Library utility was used to create the MDFF HELP library, which uses the same format as a VMS HELP library.

BACKGROUND

NRL-SSC developed the MDFF to provide a standard library of compressed chart data (CAC) in support of digital moving-map systems and mission planning systems for Navy and Marine Corps aircraft, including the F/A-18 and AV-8B platforms. The DMA ARC (Equal Arc-second Raster Chart) Digitized Raster Graphics (ADRG) is the source for the CAC database. NRL's CAC database is distributed by DMA as a library of CD-ROMs (Compact Disk Read-Only Memory). The MDFF began producing CAC in April 1990.

The NRL CAC production software is a turn-key system that requires very little operator intervention. It consists of a user-friendly interface and a suite of production utilities. Software features include error recovery (e.g., processing resumption after a power loss), comprehensive quality control, design and implementation of custom color palettes, and extensive database tracking capabilities. The software also features parallel production of multiple data sets (i.e., several CAC installments are produced simultaneously).

This on-line HELP facility has been designed to provide information concerning CAC processing and other information specific to the MDFF which includes information about individual processing phases, production software usage, and source code descriptions. The MDFF HELP library is intended for all types of system users; from *novice production* personnel to the more experienced *system administrators*. Novice users might find common acronyms and definitions which are defined within MDFF HELP to be particularly useful, whereas *seasoned production personnel* would utilize the CAC program and source code description portions.

REQUIREMENTS

Main MDFF HELP topics were designed to compartmentalize and accommodate a wide variety of subjects, including the following:

- ◆ **Common Terminology**, where common acronyms and definitions are defined.
- ◆ **Relevant VAX/VMS Features**, where common VMS features are identified (e.g., logical names and symbols).
- ◆ **Individual CAC Processing Phases**, where each phase is identified and explained.
- ◆ **CAC Program Descriptions**, where all programs within the production suite are identified and described.
- ◆ **Source Code Descriptions**, where subroutines are identified and described in terms of their functionality and usage.
- ◆ **Color Palette Creation**, where all programs and source code used to build CAC color palettes are identified and described.

Main menu topics are based on these subjects. Topic names, though lengthy, are descriptive and follow DEC recommendations for restricting names to upper and lower cases, digits, underscores, and hyphens. The MDFF HELP main menu is shown in figure 1. The MDFF HELP library has been continually developing to reflect the research and development efforts of the MDFF. Earlier versions of the library have been published as Memorandum Reports^{1,2} and are available for use. Once all of the MDFF software documentation is complete, a final publication containing the completed MDFF HELP library will be available.

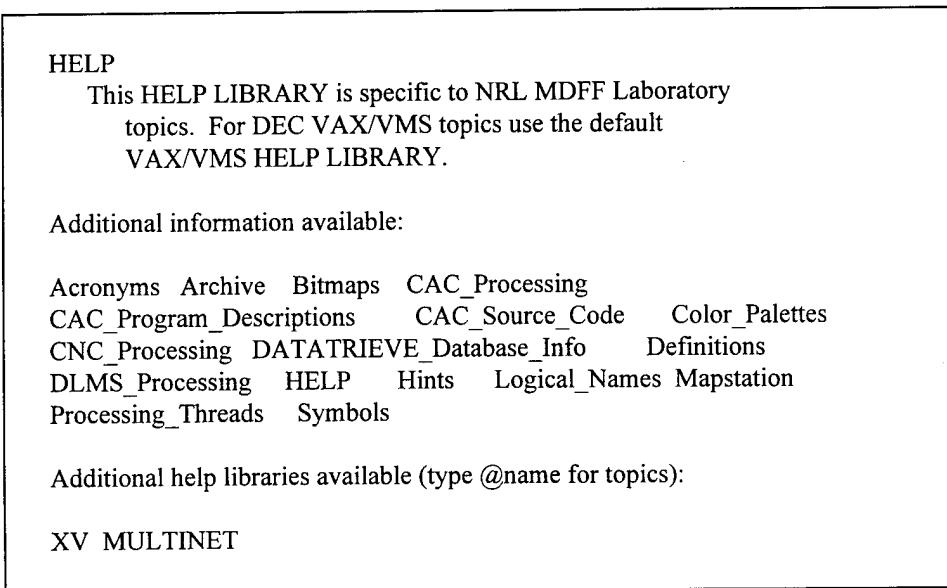


Figure 1. MDFF HELP Main Topics Menu

TOPIC FORMATS

Topic formats vary to accommodate the information conveyed. For example, the **ACRONYMS** and **DEFINITIONS** topics both use the format shown in figure 2, where a description of the topic is provided and there are no subtopics.

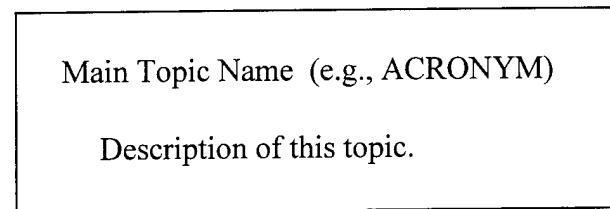


Figure 2. Main Topic Format without Subtopics

Other main topics contain additional types of information which require the use of subtopics. These subtopics typically include descriptions and examples of usage and other specific information. For example, the **CAC_PROCESSING** topic contains a subtopic for *each CAC processing phase*, whereas the **BITMAPS** topic contains subtopics for the *different types of bitmap files*. Figure 3 shows the format used by these main topics.

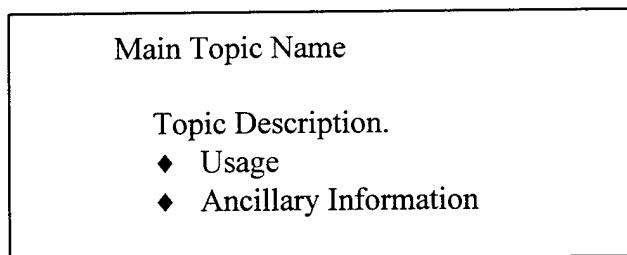


Figure 3. Main Topic Format with Subtopics

The **CAC_SOURCE_CODE** topic contains the largest number of sub-topics in the library, documenting *every subroutine* that is used by the CAC production software. Since it was designed to assist with actual usage and continued software development, this topic contains in-depth descriptions of code usage, arguments, and invocation. This information is presented in the format shown in figure 4.

CAC_SOURCE_CODE topic

Subroutine *Name.Type* (where *Type* is either .FOR or .C)

- ◆ Brief description of the subroutine's purpose and usage
- ◆ Invocation Syntax
- ◆ Definition of arguments, including data type and whether arguments are passed or returned
- ◆ Examples of invocation

Figure 4. CAC_SOURCE_CODE Sub-Topic Format

Some subroutines in this topic are grouped together as *software suites* since they are used collectively to perform certain tasks. Information about these software suites is presented using the format shown in figure 5.

CAC_SOURCE_CODE topic

Subroutine Suite *Name.Type* (where *Type* is either .FOR or .C)

- ◆ General overview of routines within the software.
- ◆ Include files
- ◆ Global variables
- ◆ Description of individual routines within the suite (in the format shown in figure 2.)

Figure 5. CAC_SOURCE_CODE Software Suite Format.

FUNCTIONALITY

The presentation of on-line documentation in the MDFF HELP library is functionally identical to the VAX/VMS HELP library. The MDFF HELP library is invoked with the DEC Control

Language (DCL) symbol *MDFFHELP*, which is a convenient abbreviation for the rather lengthy VAX/VMS librarian command:

```
HELP/LIBRARY = MDFF_SYSTEM:[DOCS_HELP]MDFF.HLB
```

The VAX/VMS Library utility is used to create the MDFF HELP library, which is built from individual files in the MDFF_SYSTEM:[DOCS_HELP] directory. Each file contains all of the information for a single main topic, and each of these files use an *.HLP* file extension. For example, all of the acronyms in the ACRONYMS main topic are defined within **ACRONYMS.HLP** file.

The complete set of files that are used to build the MDFF HELP library are listed and described below:

ACRONYMS.HLP	Defines commonly used Acronyms.
ARCHIVE.HLP	Documents software for displaying and maintaining archive data sets.
BITMAPS.HLP	Describes use of Bitmaps by the processing software.
CAC_PROCESSING.HLP	Describes the various components of CAC data processing.
CAC_PROGRAM_DESCRIPTIONS.HLP	Provides functional descriptions of all executable images.
CAC_SOURCE_CODE.HLP	Provides functional descriptions of all subprograms that are used within the CAC processing suite.
COLOR_PALETTE.HLP	Provides functional descriptions of software related to color palette creation.
CNC_PROCESSING.HLP	Describes components of Compressed Nautical Chart (CNC) processing. (This section is incomplete).
DATATRIEVE_DATABASES.HLP	Provides information about the DATATRIEVE data bases that are used in AOD image processing, CAC and CNC processing, and in tracking ADRG CD-ROMs

	received from DMA.
DEFINITIONS.HLP	Defines commonly used terms.
DLMS_PROCESSING.HLP	Describes components of Digital Land Mass System (DLMS) processing. (This section is incomplete).
HINTS.HLP	Provides suggestions about how to use the MDFF HELP library.
LOGICAL_NAME.HLP	Describes Logical Name usage.
MAPSTATION.HLP	Documents how to use the Map Station software and computers.
MDFF.HLP	Contains text that is displayed when the MDFF HELP library is invoked.
PROCESSING_THREAD.HLP	Defines CAC processing threads and describes their usage.
SYMBOLS.HLP	Describes common symbol usage.

The VAX/VMS Library utility requires HELP files to be written in a specific format. Each file contains key numbers in the first column, followed by the name of the key. Topics that will appear in the initial topic listing, as shown in Figure 1, must use key 1. All subtopics use keys 2 through 9, in hierarchical order. An example of this file structure is provided in Figure 6, which lists the first 12 lines of **DEFINITIONS.HLP**.

CREATION AND MAINTENANCE

A DCL command file (Figure 7) called MDFFHELP_REBUILD.COM invokes the VAX/VMS Library utility and creates the MDFF HELP library. This command file contains two commands, one to create the MDFF HELP library, and the second to insert or modify topics. All topic files must have the extension *.HLP*, and they must reside in the directory MDFF_SYSTEM:[DOCS_HELP].

1 Definitions

The following topics are definitions for terms used in the MDFF.

2 Chart Updating Manual

Chart Updating Manual (CHUM), the DMA Aeronautical CHUM is a semiannual publication, with monthly supplements, that provides textual and/or graphic additions, deletions, or modifications of cartographic data to published aeronautical charts. Changes appearing in the CHUM are generally considered to be critical to flight safety.

2 Color Compression

The second phase of creating CACs, after transformation ...

Figure 6. MDFF HELP Library File Example

```
$!*****  
$!*  
$! Command file for building the MDFF HELP Library *  
$!*  
$! Written by: Stephanie A. Myrick 10/11/91 *  
$!*  
$!*****  
$!  
$! Recreate MDFF HELP library  
$ library/create=(keysize=25)/help mdff_system:[docs_help]mdff  
$!  
$!  
$! Insert all topics - files with HLP extension  
$ library/insert/help/log mdff_system:[docs_help]mdff -  
mdff_system:[docs_help]*.hlp
```

Figure 7. Command file for building MDFF HELP: MDFFHELP_REBUILD.COM

SUMMARY

On-line documentation about the MDFF is available through the MDFF HELP library. The MDFF HELP library provides information that is readily available, user-friendly, and easily maintained. MDFF HELP was designed to accommodate a wide variety of topics, including CAC processing, production software usage, and source code descriptions. The MDFF HELP library is intended for all levels of system use. Two publications containing a subset of the MDFF HELP library documentation are currently available ^{1,2}. Once all of the MDFF software documentation is complete, a final publication containing the completed MDFF HELP library, will be published.

ACKNOWLEDGMENTS

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We thank the following program managers for their support: Lt Col Robert Alcaparras, Lt Col Allen Tashima (both at DMA Headquarters), Richard Glass and Pat Corkery (both at DMA Systems Center).

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1. S.A. Myrick, et.al., "MDFF HELP Library: On-Line Documentation for the Map Data Formatting Facility", Naval Oceanographic and Atmospheric Research Laboratory, Stennis Space Center, MS. NOARL Technical Note 211, December 1991
2. S.A. Myrick, et.al., "MDFF HELP Library Version 2: On-Line Documentation for the Map Data Formatting Facility", Naval Research Laboratory, Stennis Space Center, MS. NRL Memorandum Report NRL/MR/7441--93-7071, March 1994